WHAT IS CLAIMED IS:

1. A substantially oxygen-free silicon carbide layer having a dielectric constant of less than about four.

2. The silicon carbide layer of claim 1, wherein the dielectric constant is less than about three.

3. The silicon carbide layer of claim 1, wherein the silicon carbide layer is a hydrogenated silicon carbide layer.

4. The silicon carbide layer of claim 1, wherein the silicon carbide layer is a nitrogen doped hydrogenated silicon carbide layer.

5. An integrated circuit including the silicon carbide layer of claim 1.

6. A method for forming on a substrate a substantially oxygen-free silicon carbide layer having a dielectric constant of less than about four, the method comprising the steps of:

   holding the substrate at a deposition temperature of between about zero centigrade and about one hundred centigrade,

   introducing a gas flow of tetramethylsilane at a rate of no more than about one thousand scientific cubic centimeters per minute,

   holding a deposition pressure of between about one milli Torr and about one hundred Torr,

   producing a radio frequency plasma discharge with a power of no more than about two kilowatts, and

   halting the plasma discharge when a desired thickness of the silicon carbide layer has been formed.

7. The method of claim 6, wherein the method is accomplished in a plasma enhanced chemical vapor deposition reactor.

8. The method of claim 6, wherein the deposition temperature is held at about twenty-five centigrade.

9. The method of claim 6, wherein the deposition pressure is held between about five hundred milli Torr and about seven hundred and fifty milli Torr.

10. The method of claim 6, wherein the gas flow is introduced at a rate of between about twenty-five scientific cubic centimeters per minute and about seventy-five scientific cubic centimeters per minute.

11. The method of claim 6, wherein the plasma discharge is produced with a power of between about five hundred watts and about seven hundred and fifty watts.

12. The method of claim 6, further comprising the step of introducing at least one of helium, nitrogen, argon, methane, and ammonia gas during the plasma discharge.

13. The method of claim 6, wherein the deposition temperature is held at about twenty-five centigrade, the tetramethylsilane is introduced at a rate of about seventy-five scientific cubic centimeters per minute, helium gas is introduced during the plasma discharge at a rate of about two hundred scientific cubic centimeters per minute, the deposition pressure is held at about five hundred milli Torr, and the plasma discharge is produced with a power of about eight hundred watts.

14. The method of claim 6, wherein the deposition temperature is held at about twenty-five centigrade, the tetramethylsilane is introduced at a rate of about twenty-five scientific cubic centimeters per minute, nitrogen gas is introduced during the plasma discharge at a rate of about four hundred scientific cubic centimeters per minute, the deposition pressure is held at about seven hundred and fifty milli Torr, and the plasma discharge is produced with a power of about six hundred watts.

15. The method of claim 6, wherein the deposition temperature is held at about twenty-five centigrade, the tetramethylsilane is introduced at a rate of about twenty-five scientific cubic centimeters per minute, methane gas is introduced during the plasma discharge at a rate of about two hundred scientific cubic

centimeters per minute, the deposition pressure is held at about seven hundred and fifty milli Torr, and the plasma discharge is produced with a power of about seven hundred and fifty hundred watts.

16. The method of claim 6, further comprising the step of treating the silicon carbide layer with at least one of a helium plasma and a hydrogen plasma at a temperature of no more than about four hundred centigrade.

17. The method of claim 6, further comprising the step of treating the silicon carbide layer with a thermal anneal at a temperature of between about one hundred centigrade and about four hundred centigrade under one of a vacuum environment and an inert gas ambient environment.

18. An inter layer dielectric stack, comprising:
a bottom layer of a substantially oxygen-free silicon carbide material having a dielectric constant of less than about four,
a middle layer of a low k material, and
a top layer of a substantially oxygen-free silicon carbide material having a dielectric constant of less than about four.

19. The inter layer dielectric stack of claim 18, wherein the middle layer of the low k material comprises a first layer and a second layer of the low k material, with an intervening layer of a substantially oxygen-free silicon carbide material having a dielectric constant of less than about four.

20. An integrated circuit including the inter layer dielectric stack of claim 18.